

What is claimed:

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1 1. A semiconductor device comprising a field effect transistor, the field effect  
2 transistor including a gate dielectric layer, a source region and a drain region, wherein a first  
3 semi-recessed LOCOS layer is provided between the gate dielectric layer and the drain  
4 region, a second semi-recessed LOCOS layer is provided between the gate dielectric layer  
5 and the source region, a first offset impurity layer is provided below the first semi-recessed  
6 LOCOS layer, and a second offset impurity layer is provided below the second semi-  
7 recessed LOCOS layer.

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1 2. A semiconductor device according to claim 1, wherein the first semi-recessed  
2 LOCOS layer and the second semi-recessed LOCOS layer each have a thickness of 0.3 – 0.7  
3  $\mu\text{m}$ .

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2 3. A semiconductor device according to claim 1, further comprising an element  
isolation region, wherein the element isolation region has a semi-recessed LOCOS structure.

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2 4. A semiconductor device according to claim 3, wherein a channel stopper  
layer is provided below the element isolation region.

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2 5. A semiconductor device according to claim 1, wherein a low concentration  
impurity layer having a conductivity type identical with conductivity type of the drain region  
3 is provided adjacent to the drain region.

1           6.       A method for manufacturing a semiconductor device comprising a field  
2 effect transistor, the field effect transistor including a gate dielectric layer, a source region  
3 and a drain region, wherein a first semi-recessed LOCOS layer is provided between the gate  
4 dielectric layer and the drain region, a second semi-recessed LOCOS layer is provided  
5 between the gate dielectric layer and the source region, a first offset impurity layer is  
6 provided below the first semi-recessed LOCOS layer, and a second offset impurity layer is  
7 provided below the second semi-recessed LOCOS layer, the method comprising:

8           forming a first recessed section in a region where the first semi-recessed LOCOS  
9 layer is to be formed, and forming a second recessed section in a region where the second  
10 semi-recessed LOCOS layer is to be formed

11           implanting an impurity in a semiconductor substrate in the first recessed section and  
12 in the second recessed section; and

13           thermally oxidizing the semiconductor substrate to form the first semi-recessed  
14 LOCOS layer in the first recessed section and to form the second semi-recessed LOCOS  
15 layer in the second recessed section.

1           7.       A method for manufacturing a semiconductor device according to claim 6,  
2 further comprising forming an anti-oxidation layer having a predetermined pattern, wherein  
3 the thermally oxidizing the semiconductor substrate to form the first semi-recessed LOCOS  
4 layer in the first recessed section and to form the second semi-recessed LOCOS layer in the  
5 second recessed section is conducted using the anti-oxidation layer formed on the  
6 semiconductor substrate as a mask.

1           8.       A method for manufacturing a semiconductor device according to claim 7,  
2 wherein the anti-oxidation layer has a film thickness of 50 – 70 nm.

1           9.       A method for manufacturing a semiconductor device according to claim 7,  
2 further comprising, before the forming of the anti-oxidation layer, forming a protection film  
3 over the semiconductor substrate in the first recessed section and in the second recessed  
4 section.

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1 10. A method for manufacturing a semiconductor device according to claim 9,  
2 wherein the protection film is a silicon oxide layer.

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1 11. A method for manufacturing a semiconductor device according to claim 10,  
2 wherein the silicon oxide layer is formed by a thermal oxidation method.

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1 12. A method for manufacturing a semiconductor device according to claim 9,  
2 further comprising, after the implanting an impurity in the semiconductor substrate in the  
3 first recessed section and in the second recessed section, removing the protection film.

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1 13. A method for manufacturing a semiconductor device according to claim 6,  
2 wherein the first recessed section and the second recessed section each are formed in a  
3 tapered configuration.

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1 14. A method for manufacturing a semiconductor device according to claim 13,  
2 wherein a tapered angle of each of the first recessed section and the second recessed section  
3 is 60 degrees or greater less than 90 degrees.

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1 15. A method for manufacturing a semiconductor device according to claim 6,  
2 wherein an implanting direction of the impurity traverses a normal line of a surface of the  
3 semiconductor substrate during the implanting an impurity in the semiconductor substrate in  
4 the first recessed section and in the second recessed section.

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1 16. A method for manufacturing a semiconductor device according to claim 15,  
2 wherein the implanting direction of the impurity and the normal line of the surface of the  
3 semiconductor substrate define an angle that is greater than zero degrees and no greater than  
4 45 degrees.

1           17.    A semiconductor device comprising:  
2           first and second field effect transistors each including a gate dielectric layer; source  
3           and drain regions; a first semi-recessed LOCOS layer positioned between the gate dielectric  
4           layer and the drain region; a second semi-recessed LOCOS layer positioned between the  
5           gate dielectric layer and the source region; a first offset impurity layer below the first semi-  
6           recessed LOCOS layer; and a second offset impurity layer below the second semi-recessed  
7           LOCOS layer; and  
8           an element isolation region located between the first and second field effect  
9           transistors.

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1           18.    A semiconductor device according to claim 17, wherein said element  
2           isolation region includes a semi-recessed LOCOS structure.

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1           19.    A semiconductor device according to claim 17, further comprising a channel  
2           stopper layer formed below the element isolation region.

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1           20.    A liquid crystal display driver comprising the semiconductor device of claim  
2           17.